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## ADVISORY

**TO:** Heads of Fire Departments and Building Officials

**FROM:** Stephen D. Coan, State Fire Marshal  
Thomas Gatzunis, Commissioner, Department of Public Safety

**DATE:** June 1, 2008

**SUBJECT: Flexible Coupling/Shaft Failures – Stationary Fire Pump Installations**

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The State Fire Marshal's Office and the Department of Public Safety have been made aware of a concern with flexible couplings used in stationary fire pump installations installed under the 6<sup>th</sup> edition of the *Massachusetts State Building Code*, or earlier editions of the Building Code. The flexible coupling connecting the driver to the pump may catastrophically fail. This failure will immediately separate the fire pump from the driver, resulting in a facility that is left without any protection, and leaving firefighters and building occupants at risk.

If you have such a stationary fire pump installation in your jurisdiction, please be aware that property owners are required to inspect, test, and maintain their pumps in accordance with NFPA 25 (weekly run, annual flow, annual alignment). Given that flexible couplings have demonstrated failure, a mechanical guard should be installed around the coupling before any testing is performed. Any issues with existing flexible couplings will likely be discovered through routine inspection, testing, and maintenance. This issue will not be discovered if pumps are allowed to go untested. Fire protection system maintenance is required by the State Building Code's reference to NFPA 25 and per 527 CMR: 1.06(2). History indicates that the flexible coupling issue is of greater concern for diesel engine driven fire pumps due to the increased difficulty in aligning shafts and due to greater variance in run speeds.

The flexible coupling concerns raised in this advisory are the result of an actual failure of a coupling in a pre-manufactured pump house (pump, driver, controller sold together in an enclosure/skid). This particular failure occurred three times on the same pump. Subsequent to the multiple failures, it was discovered that no flexible couplings are available that have been tested and listed by an independent nationally recognized testing laboratory (prior to January 2008). As of today, there are still no flexible couplings or shafts listed for such use when the pump is driven by a

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diesel engine. Furthermore, reported failures of fire pump components that connect the engine to a vertical fire pump have led to a requirement in the latest edition of NFPA 20 where the pump manufacturer must evaluate the entire system as a package for potential torsion failures. The 7<sup>th</sup> Edition Basic Building Code, which is about to be issued, will reference the latest edition of NFPA 20 and, as a matter of due diligence, it is recommended on new installations that the requirement for the torsion analysis be complied with and followed to ensure viable driver-to-pump coupling performance.

If anyone encounters failure of this coupling, please contact Dana Haagensen, Fire Protection Engineer for the Office of the State Fire Marshal, directly at 978-567-3376 so that this data can be tracked.

If anyone requires additional information, please contact either the Department of Fire Services or the Department of Public Safety staff.

SDC/bhs